

IN THE CLAIMS

Please amend the claims as follows.

1. (Currently Amended) A system for identifying anomalous targets comprising:

an one or more imaging subsystem subsystems to generate track files from an image comprising targets a track file for a plurality of targets, wherein the track file comprises both static and non-static features of the targets imaged over time;

an image processing subsystem to extract predetermined features from the track files to generate two or more feature sets for the imaged targets, each feature set corresponding to one of the extracted features comprising at least first and second feature sets; and

a discrimination subsystem to generate two or more probabilistic belief functions corresponding, respectively to the two or more feature sets, and to generate a first probabilistic belief function from the first feature set and a second probabilistic belief function from the second feature set for generating an output from both by separately weighting the two or more belief functions associated with both the static and the non-static features, the output being a probability indicating whether or not at least some of the targets are anomalous,

wherein the belief functions are discrete probability functions comprising probability distributions describing when the targets are likely anomalous, and

wherein weights associated with the belief functions are updated based on actual results indicating whether or not the targets are actually anomalous, an experienced operator's analysis of the image with respect to the extracted features, and

wherein the probability that a target is anomalous comprises an arithmetic function of the first and second belief functions.

2. (Currently Amended) The system of claim 1 wherein the targets comprise cells and the image comprises an image of a tissue sample, and

wherein the discrimination subsystem initially generates the belief functions from the extracted features and known anomalous cells to provide a probability that at least some of the cells are anomalous,

wherein a the first feature set comprises a ratio of nucleus size to cell size, and

wherein a the second feature set comprises cell reaction to stain or dye,

wherein a third feature set comprises a rotational component of a cell, and

wherein a fourth feature set comprises a velocity component of a cell.

3. (Currently Amended) The system of claim 1 wherein the track files associated with the non-static features include a rate-of-change of one or more of the non-static features the imaging subsystem generates the track files from either photographs or scanned images of tissue samples that includes cells.

4. (Currently Amended) The system of claim 1 wherein the imaging subsystem generates the track files from optical data of tracked targets for melanoma detection, and wherein the static features comprise pigment changes cells collected either by a microscope or a microscopic-imaging camera, the cells being collected from a tissue sample.

5. (Original) The system of claim 1 wherein the imaging subsystem generates the track files from optical data to comprise an array of elements to represent the image, each array element to include at least two-dimensional (2D) imaging components, and each array element to further include a velocity component and a rotational component to represent respectively velocity and rotation of targets exhibiting velocity and/or rotation within the image,

wherein the velocity component represents movement of a target within a field-of-view of the image, the rotational component represents rotational movement of a target within the field-of-view of the image.

6. (Currently Amended) The system of claim 1 wherein the imaging subsystem generates the track file for both the static and non-static features from optical data to comprise an array of array elements to represent the image, each army element to include three-dimensional (3D) imaging components generated from images at a plurality of two-dimensional focal planes.

7. (Currently Amended) The system of claim 1 wherein the imaging subsystem generates a plurality of two-dimensional (2D) images of the ~~sample~~ targets at various depths to generate three-dimensional (3D) imaging components of the track file for both the static and non-static features for the image.

8. (Cancelled)

9. (Currently Amended) The system of claim 1 wherein the first feature set to indicate at least one static feature comprising ~~motion, rotation, target size, target shape, target outline, ratio of target size to other targets, and ratio of size of predetermined elements, and~~

~~wherein the second feature set comprises a non-static feature comprising at least one of motion and rotation-one of the features not included in the first feature set.~~

10. – 11. (Cancelled)

12. (Currently Amended) The system of claim [[11]]1 wherein the image processing subsystem includes a morphological filter perform morphological filtering on the ~~identified~~ targets, the filtering to exaggerate features for ~~identified~~ targets meeting a criteria for a feature set.

13. (Original) The system of claim 12 wherein the image processing subsystem identifies target cells having normal-sized nuclei, the morphological filter attenuates the normal-sized nuclei and darkens nuclei of target cells having larger than normal-sized nuclei.

14. (Previously Presented) The system of claim 12 wherein the image processing subsystem generates a morphed image file with the exaggerated features for displaying a morphed image to the experienced operator to help the operator identify anomalous targets.

15. (Original) The system of claim 9 wherein the features sets are stored remotely and are accessed over a network.

16. (Cancelled)

17. (Currently Amended) The system of claim 16 wherein the belief functions are initially weighted based on initial belief funtions generated from known anomalous targets as part of a supervised training process.

18. (Original) The system of claim 17 wherein the discrimination subsystem updates the initial belief functions as part of an unsupervised training process based on measurable characteristics of the targets identified by the image processing subsystem.

19. (Original) The system of claim 18 wherein the initial belief functions and associated feature sets are stored in a remotely located belief function database for use by other systems.

20. – 24. (Cancelled)

25. (Currently Amended) A method for identifying anomalous targets comprising:
generating a track file for a plurality of targets, wherein the track file comprises both static and non-static features of the targets imaged over time track files from an image comprising targets;

extracting predetermined features from the track files to generate two or more feature sets for the imaged targets, each feature set corresponding to one of the extracted features from the track file to generate first and second feature sets; and

generating two or more probabilistic belief functions corresponding, respectively to the two or more feature sets, and to generate by separately weighting the two or more belief functions associated with both the static and the non-static features, the output being a probability indicating whether or not a first probabilistic belief function from the first feature set and a second probabilistic belief function from the second feature set extracted features for

generating an output from both belief functions, the output indicating that at least some of the targets are anomalous,

wherein the belief functions are discrete probability functions comprising probability distributions describing when the targets are likely anomalous, and

wherein weights associated with the belief functions are updated based on actual results indicating whether or not the targets are actually anomalous

wherein the method further comprises updating the belief functions based on an experienced operator's analysis of the one or more images with respect to the extracted features, and

wherein the probability that a cell is anomalous comprises an arithmetic function of the first and second belief functions.

26. (Currently Amended) The method of claim 25 wherein the targets comprise cells, and the image comprising the targets is an image of a tissue sample,

wherein generating comprises generating the belief functions from the extracted features and known anomalous cells to provide a probability that at least some of the cells are anomalous,

wherein a the first feature set comprises a ratio of nucleus size to cell size, and

wherein a the second feature set comprises cell reaction to stain or dye,

wherein a third feature set comprises a rotational component of a cell, and

wherein a fourth feature set comprises a velocity component of a cell.

27. (Previously Presented) The method of claim 25 further comprising:

extracting features from targets using the track file;

wherein a first feature set of the two or more feature sets indicates at least one static feature comprising target size, target shape, target outline, ratio of target size to other targets, and ratio of size of predetermined elements, and

wherein a second feature set of the two or more feature sets comprises a non-static feature comprising at least one of motion or rotation

generating feature sets for the targets, the first feature set to indicate at least one of target motion, target rotation, target size, target shape, target outline, ratio of target size to other targets, and ratio of size of predetermined elements; and

using the track file to identify targets within the image having features associated with the feature sets;

wherein the second feature set comprises one of the features not included in the first feature set.

28. (Original) The method of claim 27 further comprising performing morphological filtering on the identified targets, the filtering to exaggerate features for identified targets meeting a criteria for a feature set.

29. (Original) The method of claim 28 further comprising identifying target cells having normal-sized nuclei, and wherein morphological filtering attenuates the normal-sized nuclei and darkens nuclei of target cells having larger than normal-sized nuclei.

30. (Currently Amended) The method of claim 27 wherein generating comprises generating the track files from optical data of tracked targets for melanoma detection, wherein the static features comprise pigment changes, further comprising generating the belief functions for at least one of a selected feature set of the identified targets, the belief function being generated from the at least one selected feature set of the identified targets within the image.

31. (Currently Amended) A computer-readable storage medium that stores having stored thereon instructions for execution by one or more processors to perform operations comprising, that when executed by a computing platform, result in:

generation of a track file for a plurality of targets, wherein the track file comprises both static and non-static features of the targets imaged over time track files from an image comprising targets;

extraction of predetermined features from the track files to generate two or more feature sets for the imaged targets, each feature set corresponding to one of the extracted features ~~track file to generate first and second feature sets; and~~

generation of generate two or more probabilistic belief functions corresponding, respectively to the two or more feature sets, and to generate by separately weighting the two or more belief functions associated with both the static and the non-static features, the output being a probability indicating whether or not a first probabilistic belief function from first feature set and a second probabilistic belief function from the second feature set extracted features for generating an output from both belief functions, the output indicating that at least some of the targets are anomalous,

wherein the belief functions are discrete probability functions comprising probability distributions describing when the targets are likely anomalous, and

wherein weights associated with the belief functions are updated based on actual results indicating whether or not the targets are actually anomalous.

wherein the method further comprises updating the belief functions based on an experienced operator's analysis of the one or more images with respect to the extracted features, and

wherein the probability that a cell is anomalous comprises an arithmetic function of the first and second belief functions.

32. (Currently Amended) The computer-readable storage medium of claim 31 wherein a first feature set of the two or more feature sets indicates at least one static feature comprising of target motion, target rotation, target size, target shape, target outline, ratio of target size to other targets, and ratio of size of predetermined elements,

the track file is used to identify targets within the image having features associated with the feature sets; and

wherein a the second feature set of the two or more feature sets comprises a non-static feature comprising at least one of motion or rotation-one of the features not included in the first feature set.